



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/779,502	02/13/2004	Andrew G. Gilicinski	08935-300001	1646
26161 7590 04/09/2007 FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER ALEJANDRO, RAYMOND	
			ART UNIT	PAPER NUMBER
			1745	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/09/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/779,502

Applicant(s)

GILICINSKI ET AL.

Examiner

Raymond Alejandro

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53 is/are pending in the application.
- 4a) Of the above claim(s) 1-19 and 29-53 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 02/13/04, 11/14/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group II (claims 20-28) in the reply filed on 03/14/07 is acknowledged.

Information Disclosure Statement

2. The information disclosure statements (IDS) submitted on 11/14/05 and 02/13/04 were considered by the examiner.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 44. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "30" and "32" have both been used to designate the air mover (for example,

Art Unit: 1745

see page 5, lines 22 and 27 & Figure 1). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
6. The use of the trademarks Carbopol EZ-3, Nafion, Gore-Select have been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

7. The disclosure is objected to because of the following informalities: the status of all NON-provisional applications referenced in the specification must be updated (for example, see page 9, line 19, and pages 10 and 12). Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 20-22, 24-25 and 27 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Hirsch 2003/0170522.

The present claims are to a fuel cell system wherein the disclosed inventive concept comprises the specific configuration of the gas mover relative to the fuel cell and fuel source.

With respect to claim 20:

Figure 1 of Hirsch illustrates a fuel cell system 2 including a direct methanol fuel cell 3 (DMFC) (P0030); a methanol fuel delivery source 4 (P0030, 0032) and a pump 24 (the gas mover) assisting in the circulation of fuel and positioned between the fuel cell 3 and the fuel delivery source 4 (See FIGURE 1 & P0032-0033).

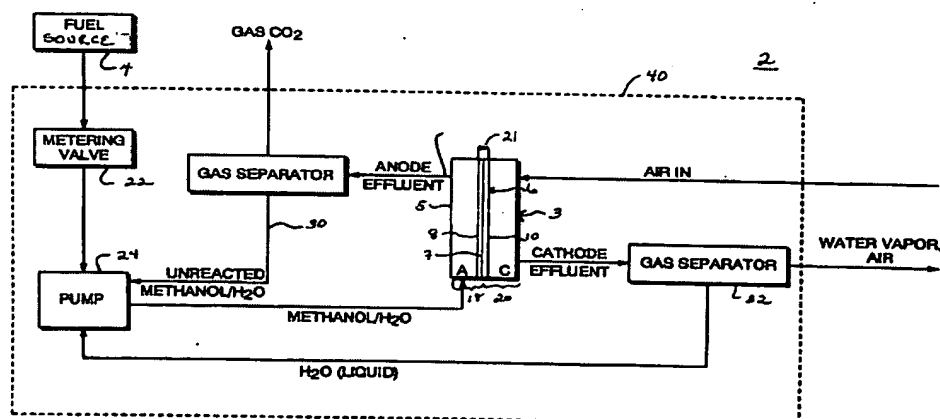


FIG. 1

Art Unit: 1745

With respect to claim 21:

Fuel delivery source 4 is designed to enclose/hold and to supply the methanol (P0030, 0032). *Thus, it comprises a housing.* Figure 1 depicts its outlet (See FIGURE 1); and the pump 24 (the gas mover) is positioned between the fuel cell 3 and the fuel delivery source 4 (See FIGURE 1 & P0032-0033).

With respect to claim 22:

Disclosed therein is that un-reacted methanol and water is separated from carbon dioxide in separator 30 and re-circulated to the pump 24 (P0033). *Thus, in this case, gas separator 30 separating un-reacted methanol and water from carbon dioxide is taken to also represent a fuel source (because it is supplying un-reacted methanol), and in combination with the recirculation loop provide the necessary arrangement to have the pump 24 between the fuel source inlet and the fuel cell after a first recirculation loop cycle is completed.*

With respect to claim 24:

In the absence of a specific structural description of a diffusion tube, it is contended that the pipe supplying methanol/H₂O to the fuel cell (See FIGURE 1) can be considered to be a diffusion/distribution tube.

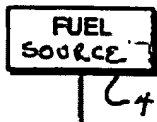
With respect to claim 25:

Metering valve 22 is placed between the fuel cell 3 and the fuel delivery source 4 (See FIGURE 1).

With respect to claim 27:

Art Unit: 1745

Fuel delivery source 4 contains fuel (P0030). *Thus, it inherently includes a space/volume (cavity) configured to hold/contain/enclose fuel and an opening allowing fuel to flow out of fuel delivery source.*



Thus, the present claims are anticipated.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirsch 2003/0170522 as applied to claim 20 above, and further in view of Agnew et al 2004/0062973.

Art Unit: 1745

Hirsch is applied, argued and incorporated herein for the reasons manifested above. Nonetheless, the preceding reference does not expressly disclose the gas mover being fan.

Agnew et al disclose a fuel cell system (TITLE/ABSTRACT) wherein the means to pressurize the fuel comprises a pump and a fan, among other (CLAIM 12).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the fan of Agnew et al as the fuel mover of Hirsch because Agnew et al disclose that a device such as a fan can be used to pressurize fuel, thereby enhancing distribution of the fuel in the fuel cell system. Additionally, it can be concluded from Agnew et al's teachings that pumps and fans are art-recognized equivalents for purposes of fuel distribution applications.

13. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirsch 2003/0170522 as applied to claim 20 above, and further in view of Kaye 2006/0073365.

Hirsch is applied, argued and incorporated herein for the reasons manifested above. Nonetheless, the preceding reference does not expressly disclose the gas mover being fan.

Kaye discloses fuel cell cartridges for a fuel (TITLE/ABSTRACT) wherein pumps and fans can be used in the operation of a fuel cell system (P0042).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the fan of Kaye as the fuel mover of Hirsch because Kaye disclose that device such as fans and pumps can be used in fuel lines and gas lines to distribute fuel in a fuel cell system, thereby, achieving a satisfactory

Art Unit: 1745

degree of operation. Additionally, it can be concluded from Kaye's teachings that pumps and fans are art-recognized equivalents for purposes of fuel distribution applications.

14. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirsch 2003/0170522 as applied to claim 20 above, and further in view of Leach et al 2005/0118469.

Hirsch is applied, argued and incorporated herein for the reasons manifested above. Nonetheless, the preceding reference does not expressly disclose the fuel source comprising a gel.

Leach et al disclose that it is known to use a fuel substance to which a thickening agent is added to form a gel fuel (P0013). When the gel fuel is placed in a fuel refill, a highly concentrated vaporous fuel substance is delivered to a fuel cell or array of fuel cells and the associated fuel cell system. In such applications, one goal is to deliver sufficient fuel for operation to each fuel cell, and maximize the even distribution of the fuel to the active anode aspect of the catalyzed membrane (P0013).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the gel of Leach et al as the fuel source in the fuel cell system of Hirsch because Leach et al disclose that one goal, when using a fuel gel, is to deliver sufficient fuel for operation to each fuel cell, and maximize the even distribution of the fuel to the active anode aspect of the catalyzed membrane.

Art Unit: 1745

15. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirsch 2003/0170522 as applied to claim 20 above, and in view of Shah et al 2004/0120889 and further in view of Leach et al 2005/0118469.

Hirsch is applied, argued and incorporated herein for the reasons manifested above. Nonetheless, the preceding reference does not expressly disclose the specific fuel source comprising a housing and tubes defining a lumen.

Shah et al disclose that the technology to create systems for hydrogen supply, storage and delivery has not yet matched the advancements achieved in fuel cells (P0003). Accordingly, Shah et al discloses a hydrogen generator-storage device 10 (TITLE/ABSTRACT/FIGURES 2 and 2A) comprising a fuel cell inlet 52, a plurality of microporous walls assembled in a “shell and tube” configuration or fibers with well established micro-channels (P0064) wherein the fuel can be located in either the microporous hollow fibers 76; and the location of the fuel cell (external or internal of the microporous hollow fiber) is determined by the wettability of the fiber and pore surface by the fuel solution and the direction of the change in the pore radius i.e. an increase from the outer tube walls to the inner lumen side or vice-versa (P0064/ FIGURES 2 and 2A).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the specific fuel source comprising a housing and tubes defining a lumen of Shah et al in the fuel cell system of Hirsch as Shah et al disclose that their specific hydrogen generator-storage device offers a compact, orientation independent and self-regulating hydrogen generating-storing system having no moving parts affecting its mechanical stability; and their specific hydrogen generator-storage

device easily match control of system's fuel flow rate and pressure to the operating demands of the fuel cell. Additionally, Shah et al's specific hydrogen generator-storage device can be modified to incorporate both a surface energy gradient and pores with changing pore radius to control interface immobilization.

In addition, neither Hirsch nor Shah et al expressly disclose the specific the fuel source comprising a gel.

Leach et al disclose that it is known to use a fuel substance to which a thickening agent is added to form a gel fuel (P0013). When the gel fuel is placed in a fuel refill, a highly concentrated vaporous fuel substance is delivered to a fuel cell or array of fuel cells and the associated fuel cell system. In such applications, one goal is to deliver sufficient fuel for operation to each fuel cell, and maximize the even distribution of the fuel to the active anode aspect of the catalyzed membrane (P0013).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the gel of Leach et al as the fuel source in the fuel cell system of Hirsch-Shah et al because Leach et al disclose that one goal, when using a fuel gel, is to deliver sufficient fuel for operation to each fuel cell, and maximize the even distribution of the fuel to the active anode aspect of the catalyzed membrane.

16. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirsch 2003/0170522 as applied to claim 20 above, and in view of Dennis 6904943 and further in view of Leach et al 2005/0118469.

Art Unit: 1745

Hirsch is applied, argued and incorporated herein for the reasons manifested above. Nonetheless, the preceding reference does not expressly disclose the specific fuel source comprising a housing and tubes defining a lumen.

Dennis discloses that it is known to have an articulated fuel container vent system (TITLE) which is a self-adjusting vapor outlet system assisting in determining a material shut-off level in a fuel container or tank (COL 1, lines 6-10) and that accurately responds to fuel level regardless of an incline of the fuel tank with respect to a ground plane (COL 2, lines 6-10).

Particularly, Dennis discloses a fuel tank system comprising a container having a filler opening and a vent opening; a vent coupled to said vent opening for venting fuel vapors from the container until a fuel level in said container reached a predetermined level, wherein said vent comprises a hollow vent tube, a flexible sleeve coupled to said vent tube, having a hollow lumen in communication with said hollow vent tube (CLAIM 1).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the specific fuel source comprising a housing and tubes defining a lumen of Dennis in the fuel cell system of Hirsch as Dennis disclose his specific fuel container is an articulated fuel container vent system (TITLE) which is a self-adjusting vapor outlet system assisting in determining a material shut-off level in a fuel container or tank (COL 1, lines 6-10) and that accurately responds to fuel level regardless of an incline of the fuel tank with respect to a ground plane (COL 2, lines 6-10). *In this case, the teachings of Dennis et al are pertinent to Hirsch as well as to the field of applicant's endeavor because Dennis, in relevant part, addresses substantially the same problem encountered by both Hirsch as well as to the field of applicant's endeavor which is to provide a*

suitable fuel tank/container or fuel source capable of providing fuel delivery to satisfy operating demands of the system or device to which it is connected or coupled to.

In addition, neither Hirsch nor Dennis expressly disclose the specific the fuel source comprising a gel.

Leach et al disclose that it is known to use a fuel substance to which a thickening agent is added to form a gel fuel (P0013). When the gel fuel is placed in a fuel refill, a highly concentrated vaporous fuel substance is delivered to a fuel cell or array of fuel cells and the associated fuel cell system. In such applications, one goal is to deliver sufficient fuel for operation to each fuel cell, and maximize the even distribution of the fuel to the active anode aspect of the catalyzed membrane (P0013).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time the invention was made to use the gel of Leach et al as the fuel source in the fuel cell system of Hirsch-Dennis because Leach et al disclose that one goal, when using a fuel gel, is to deliver sufficient fuel for operation to each fuel cell, and maximize the even distribution of the fuel to the active anode aspect of the catalyzed membrane.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

Art Unit: 1745

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Raymond Alejandro
Primary Examiner
Art Unit 1745



RAYMOND ALEJANDRO
PRIMARY EXAMINER